

What is claimed is:

1. A device for transport of fluids comprising:
an inlet port; a waste chamber, and
an inlet to the waste chamber, wherein the inlet comprises a neck with one or more notch structured zones; wherein an absorbent material is affixed to the notch structured zones.
2. The device of claim 1 wherein the absorbent material is fleece.
3. A device for transport of fluids comprising:
an inlet port and a vent,
wherein the vent is capped with an air-permeable, fluid barrier material.
4. The device of claim 3 wherein the cap is formed from a hydrophobic material.
5. A device of claim 3 or 4 wherein the vent is located on a top of a channel.
6. A device of claim 5 wherein the vent is positioned to enable separation of air bubbles from fluid within the device.
7. A device for transport of fluids comprising:
an inlet port and a waste chamber; and
a system of channels for transport of fluid through the device, comprising a network of channels wherein a first single flow channel is providing a bifurcating flow path into two separate flow channels, wherein the two separate flow channels and the first single flow channel form substantially a Y-shape, and channels further bifurcate into a symmetrical delta, wherein the cross-sectional area of the first single flow channel and

the combined cross sectional areas of the separate flow channels are substantially identical.

8. A device of claim 7 wherein channel system terminates with a V-shaped border on the wide end of the delta.

9. A device for transport of fluids comprising:
an inlet port; a waste chamber; and a flow channel for transport of fluid through the device;
the flow channel comprising a triangular structure, comprising steps or terraces of decreasing depth as the triangular structure expands, wherein the depth are of two or more different depths, thus increasing capillary force and allowing for homogeneous spreading or re-collection of a fluid stream.

10. The device of claim 9 wherein edges of the steps or terraces comprise notched structured zones.

11. A device for transport of fluids comprising:
an inlet port; an analysis area; and a fluid flow channel, wherein the walls of the fluid flow channel comprise one or more pre-shooter stops which disrupt capillary forces and promote homogeneous fluid flow, wherein the pre-shooter stop comprises irregular shaped structures, preferably triangular or sawtooth shaped.

12. A device of claim 11 wherein the pre-shooter stop has an angle of between about 1° and about 120°.

13. A device of claim 11 wherein the pre-shooter stop has a height of between about 1 μm and 3mm.

14. A device for transport of fluids comprising:
an inlet port; a fluid flow channel; and
a sample inlet chamber comprising at least one vertical wedge shaped capillary notch which extends from a bottom of the chamber, to a top of the chamber where it is connected to the fluid flow channel, wherein the chamber fills the fluid flow channel driven by capillary action.
15. A device of claim 14 wherein the notch has an angle of between about 1° and about 150° .
16. A device for transport of fluids comprising:
an inlet port; one or more fluid flow channels; and
one or more flow disruption channels, wherein the disruption channel comprises a channel or space of low capillarity between a first and a second fluid flow channel of higher capillarity, wherein fluid flow ceases at the end of the first fluid flow channel.
17. A device for transport of fluids comprising:
an inlet port; and one or more fluid flow channel;
wherein the channels comprise one or more bifurcations from a source fluid flow channel, wherein each bifurcation comprises a bifurcation flow-through structure, comprising a curved “V” shaped structure, wherein the top of the “V” extends into the source fluid flow channel, thereby maintaining continuous capillary force.
18. A device for transport of fluids comprising a combination of two or more features as recited in any one of claims 1 through 17.
19. A device for transport of fluids comprising one or more of a pre-shooter stop, a butterfly structure, a cascade structure, a waste chamber inlet, a capillary driven sample inlet chamber, a capillary stop structure, a bifurcation flow-through mechanism, and a hydrophobic vent.

20. A device of any one of claims 1 through 19, wherein the device further comprises an analysis area.

21. A device for the analysis of fluids and other application, comprising:
a filling section, an analysis section, and a system of channels,
wherein the sections are microstructured and comprise at least one fluidic structure for the controlled transport of fluid through the microstructured sections and system of channels.

22. The device of claim 21 wherein the fluidic structures comprise at least one structure selected from the group consisting of butterfly structures, cascade structures, bifurcation flow-through structures, pre-shooter stop structures and capillary flow stop structures.

23. The device of claim 21 wherein a first single flow channel provides a bifurcating flow path into two separate flow channels, wherein the two separate flow channels and the first single flow channel form substantially a Y-shape and the channels further bifurcate into a symmetrical delta, wherein the cross-sectional area of the first single flow channel and the combined cross-sectional areas of the separate flow channels are substantially identical.

24. The device of claim 23 wherein the channel system terminates with a V-shaped border on the wide end of the delta.

25. The device of claim 21 wherein a channel comprises a triangular structure having two or more steps or terraces of decreasing depth as the triangular structure expands, thus increasing capillary force and allowing for homogenous spreading or re-collection of the fluid stream.

26. The device of claim 23 wherein edges of the steps or terraces comprise notched structured zones.

27. The device of claim 21 wherein the walls of a channel comprise one or more pre-shooter stop structures which disrupt capillary forces and promote homogenous fluid flow, and the pre-shooter stop structures comprise irregular-shaped structures.

28. The device of claim 27 wherein the pre-shooter stop structures comprise triangular or sawtooth shaped structures.

29. The device of claim 27 wherein the pre-shooter stop has an angle from about 1 degree to about 120 degrees.

30. The device of claim 27 wherein the pre-shooter stop structure has a height from about 1 micrometer to about 3 millimeters.

31. The device of claim 21 wherein the filling section comprises a sample inlet chamber having at least one vertical wedge-shaped capillary notch which extends from a bottom of the chamber to a top of the chamber where it is connected to the fluid flow chamber, wherein the chamber fills the fluid flow channel driven by capillary action.

32. The device of claim 31 wherein the notch has an angle from about 1 degree to about 150 degrees.

33. The device of claim 21 wherein the device comprises one or more flow disruption channels comprising a channel or space of low capillarity between a first and a second fluid flow channel of higher capillarity, and fluid flow ceases at the end of the first fluid flow channel.

34. The device of claim 21 wherein the channels comprise one or more bifurcations from a source fluid flow channel, and each bifurcation comprises a bifurcation flow through structure, comprising a curved V-shaped structure, wherein the top of the V structure extends into the source fluid flow channel, thereby maintaining continuous capillary force.

35. The device of claim 21 wherein the device comprises a waste section for collecting fluids from the analysis section, the waste section forming an integral part of the platform and having a vent located on a top of a channel.

36. The device of claim 35 wherein the waste section comprises a waste chamber the inlet of which comprises a neck with one or more notch-structured zones.

37. The device of claim 36 wherein an absorbent material is affixed to the notch-structured zones.

38. The device of claim 37 wherein the absorbent material is a fleece material.

39. The device of claim 35 wherein the vent is capped with an air-permeable, fluid barrier material.

40. The device of claim 39 wherein the cap on the vent is formed from a hydrophobic material.

41. The device of claim 35 wherein the vent is positioned to enable separation of air bubbles from fluid within the device.

42. The device of claim 21 comprising a combination of two or more features as recited in any one of claims 22 through 41.